

10/533686

Rec'd PCT/PTO 02 MAY 2005

Fig. 1

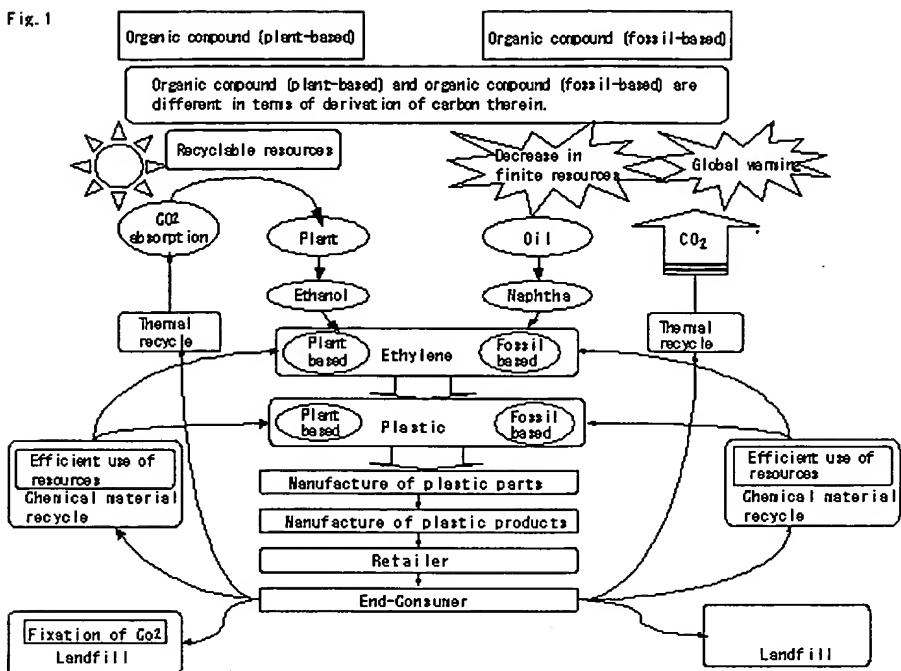
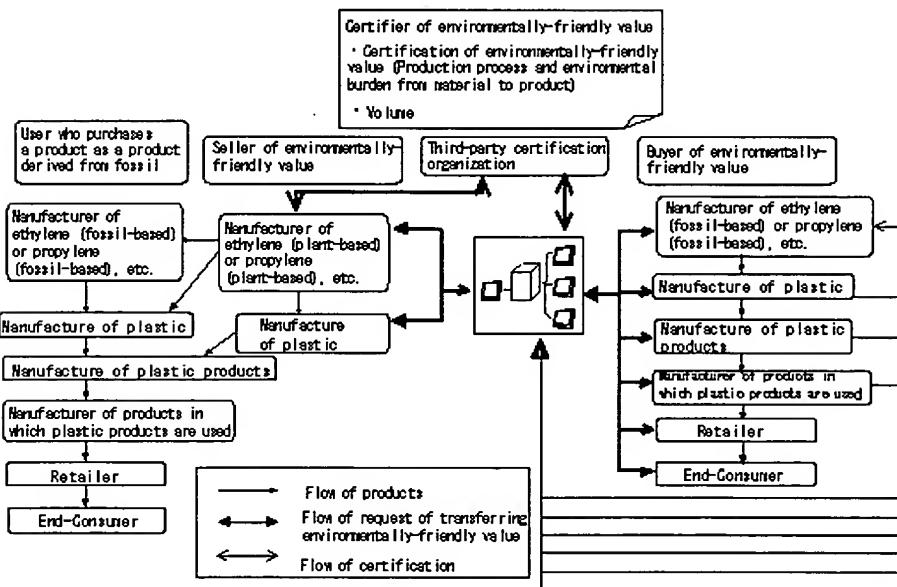


Fig. 2



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Fig.3

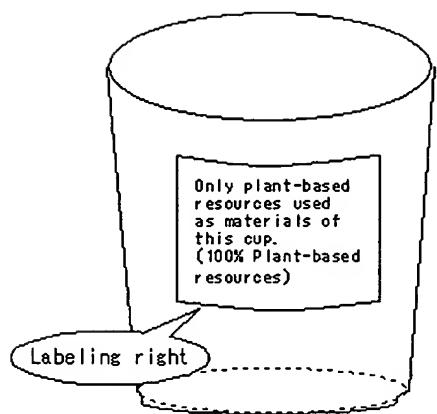


Fig.4

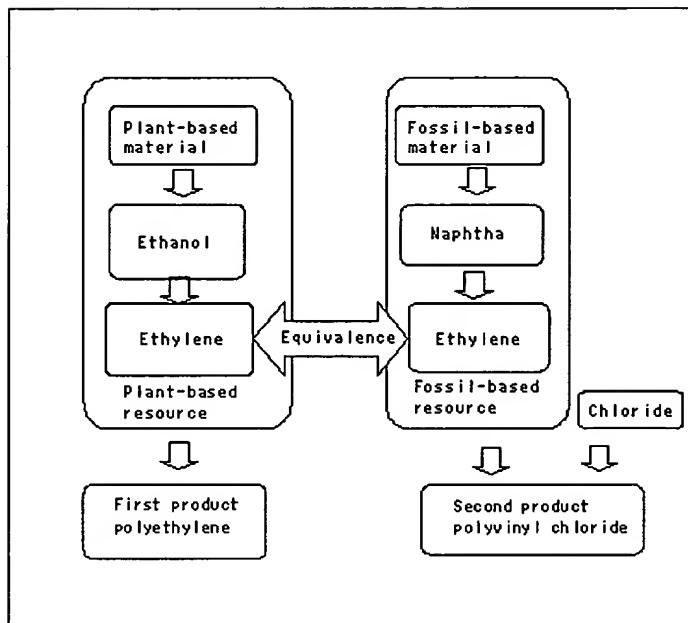


Fig.5

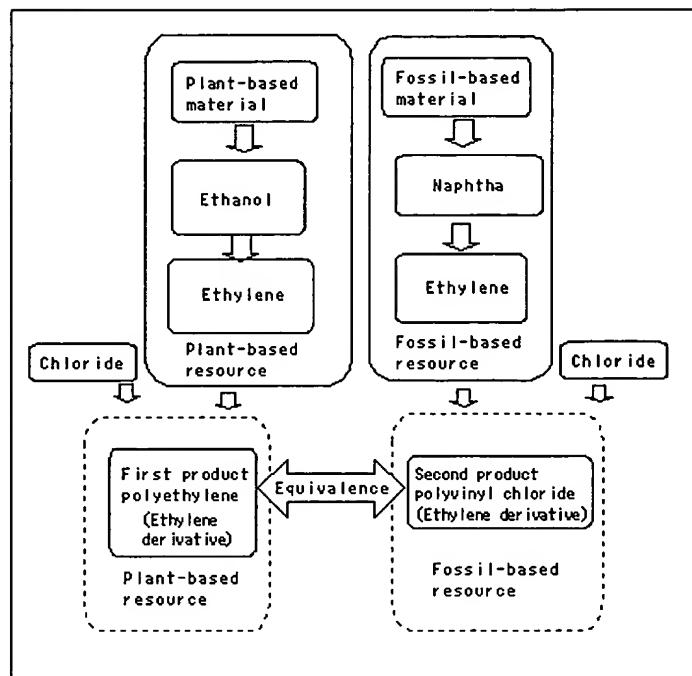


Fig.6

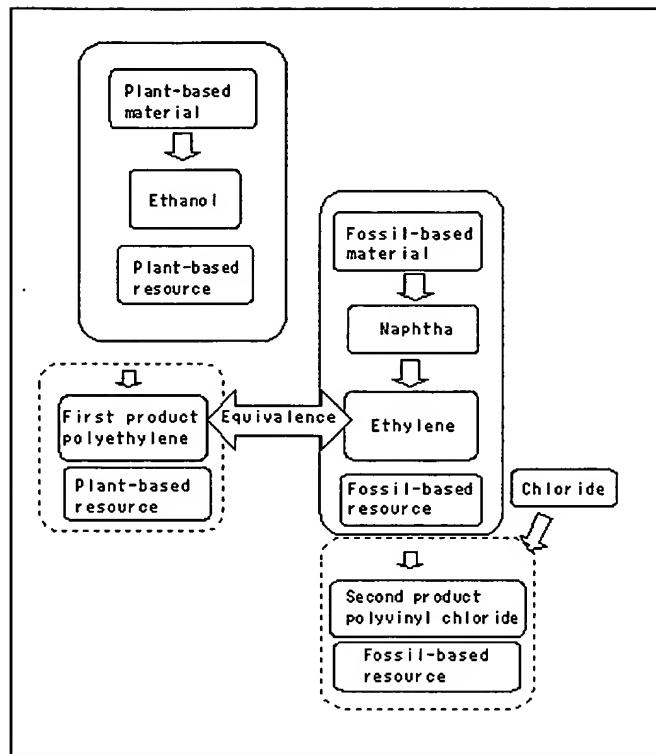
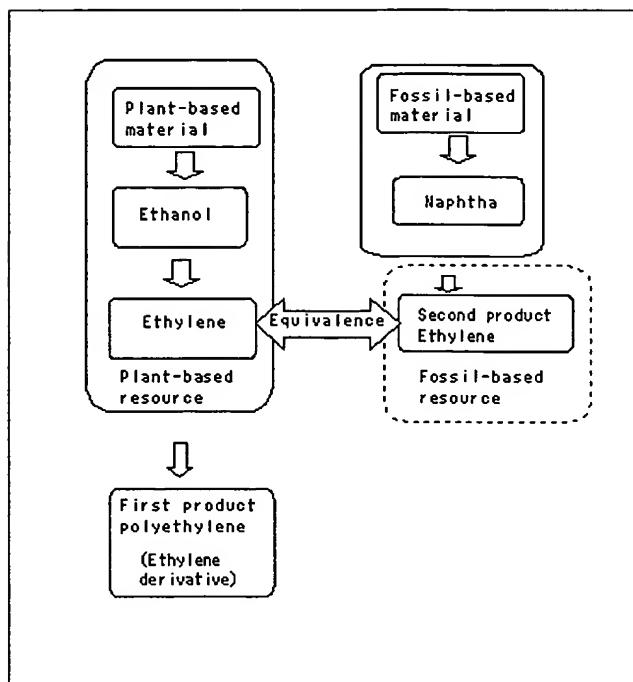
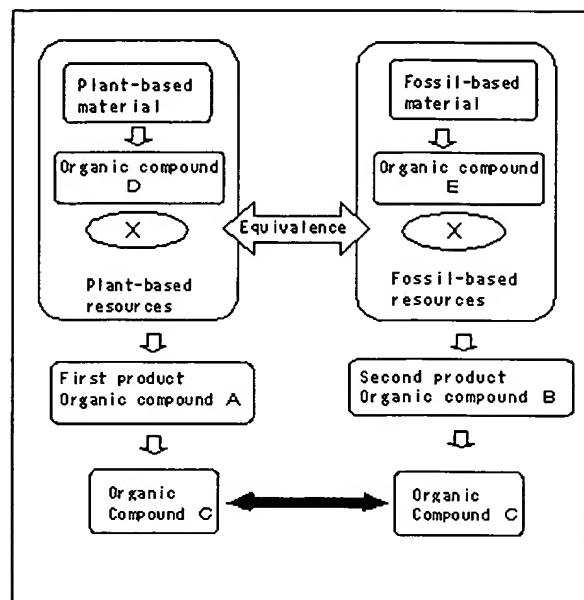


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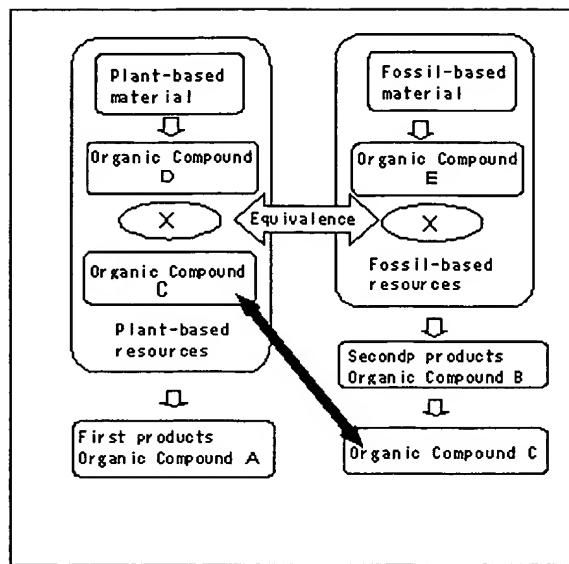
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Fig.8



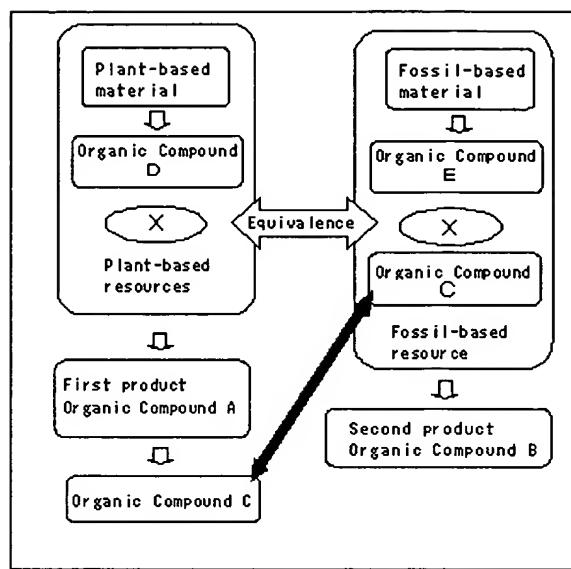
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Fig.9



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Fig.10



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Fig.11

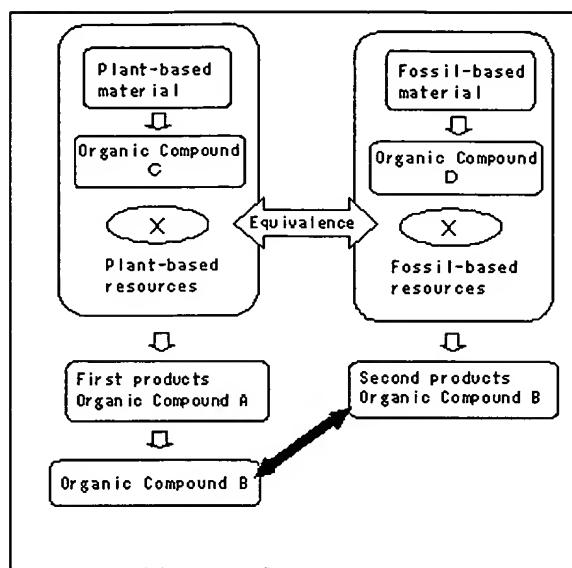


Fig.12

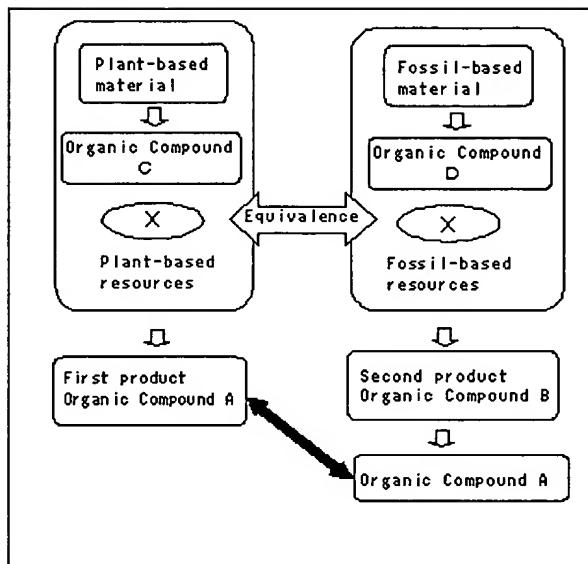


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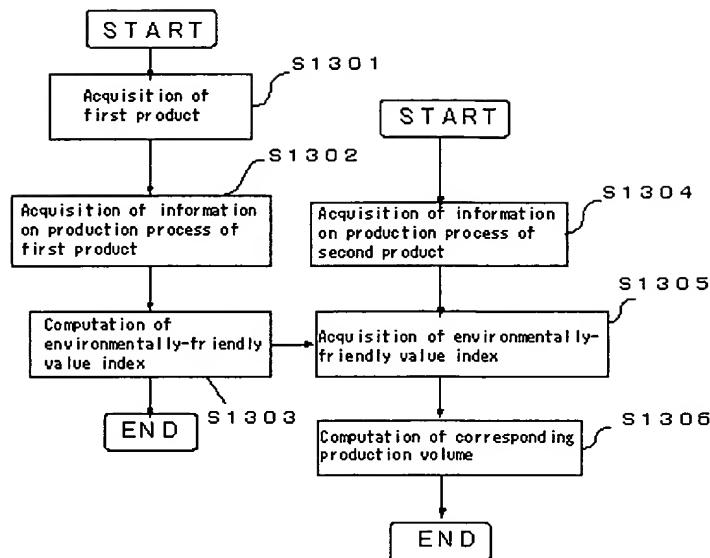


Fig.14

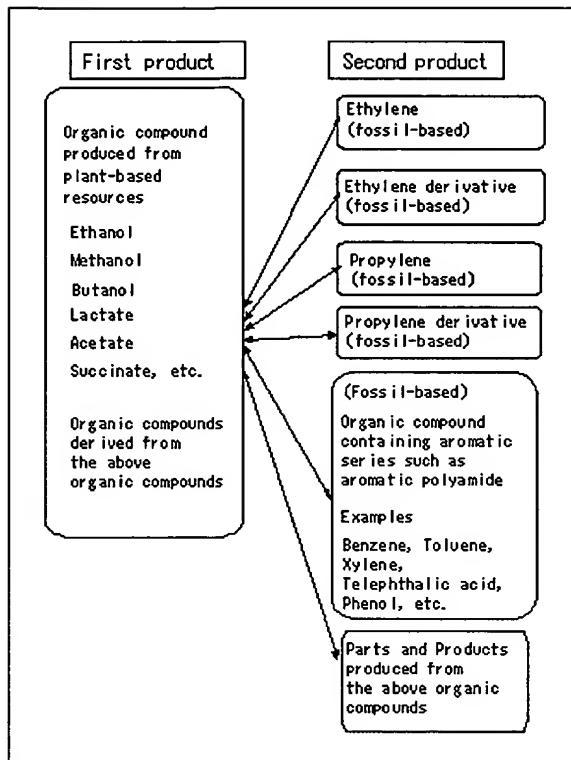


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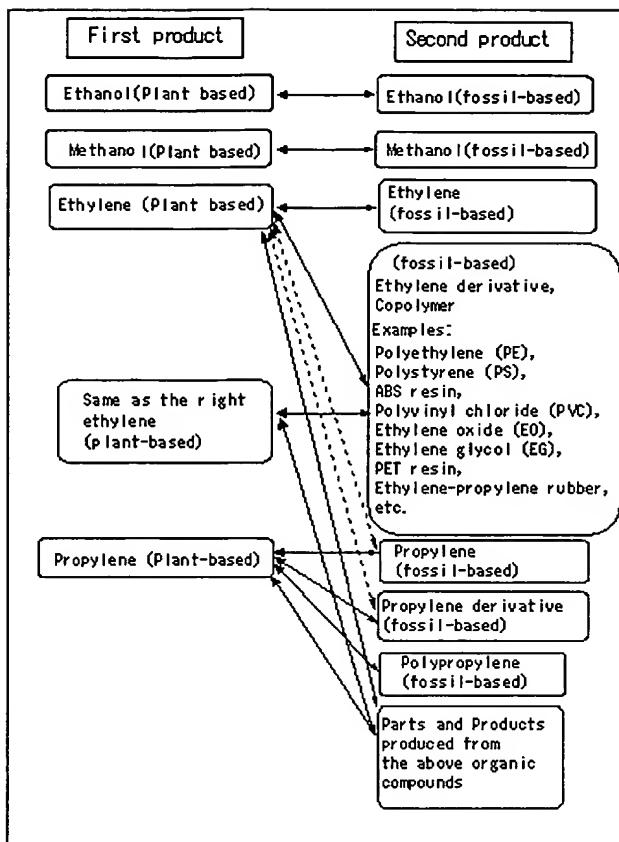


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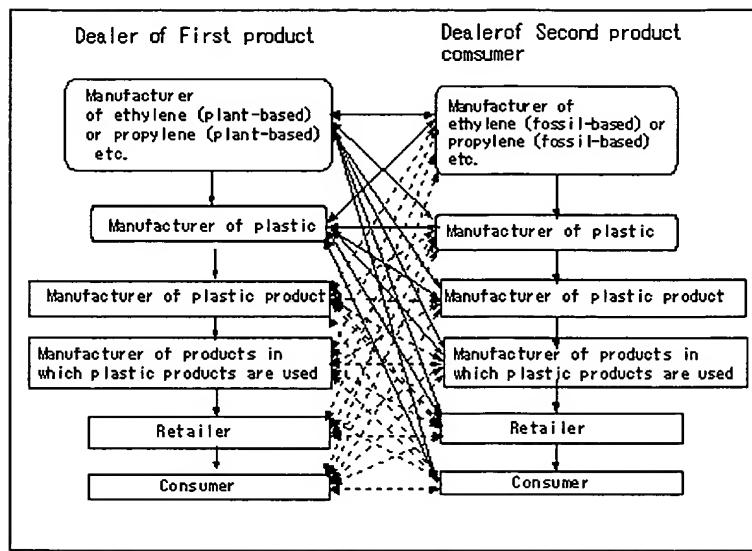
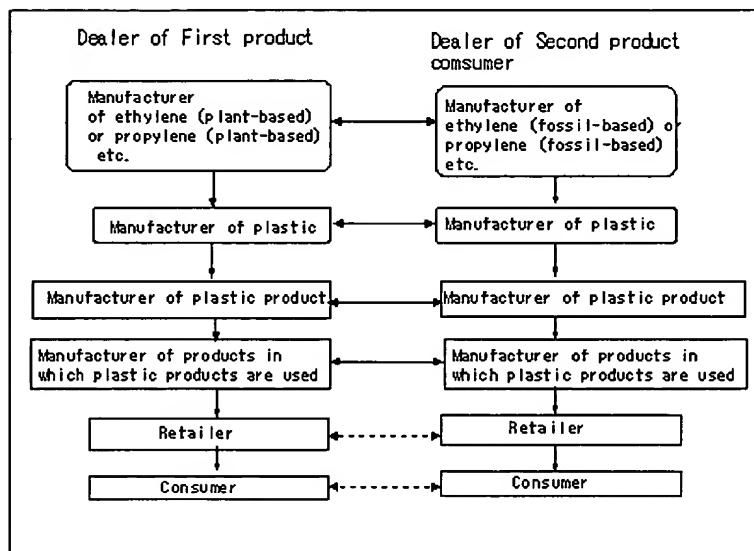


Fig.17



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Fig. 18

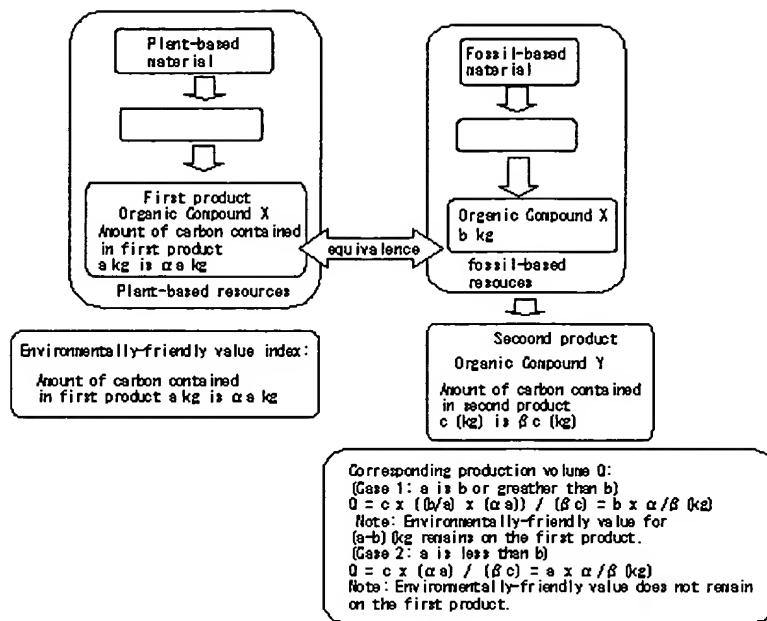


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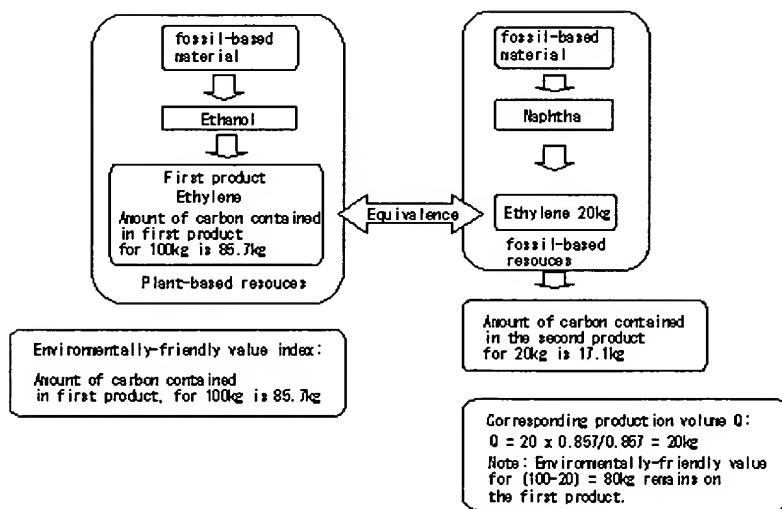


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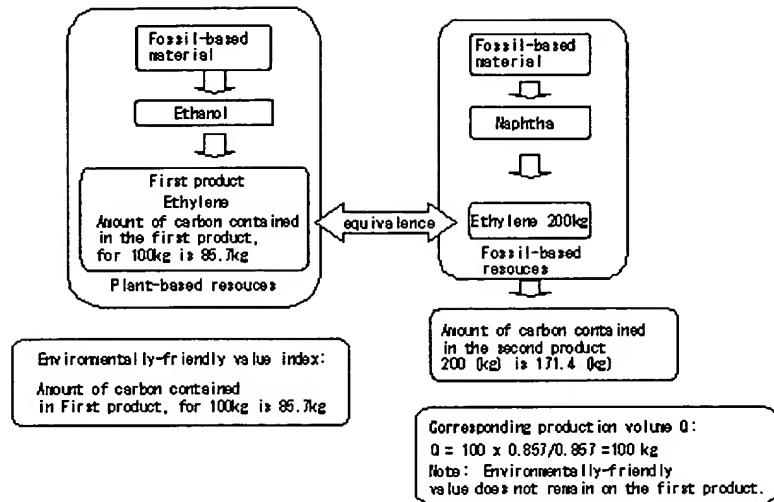


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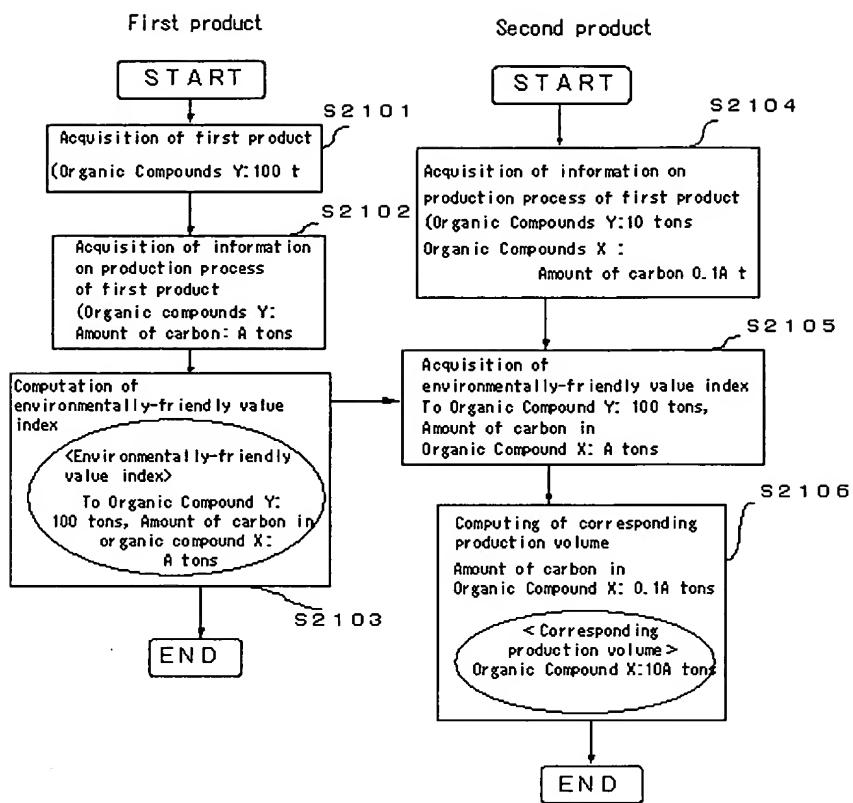
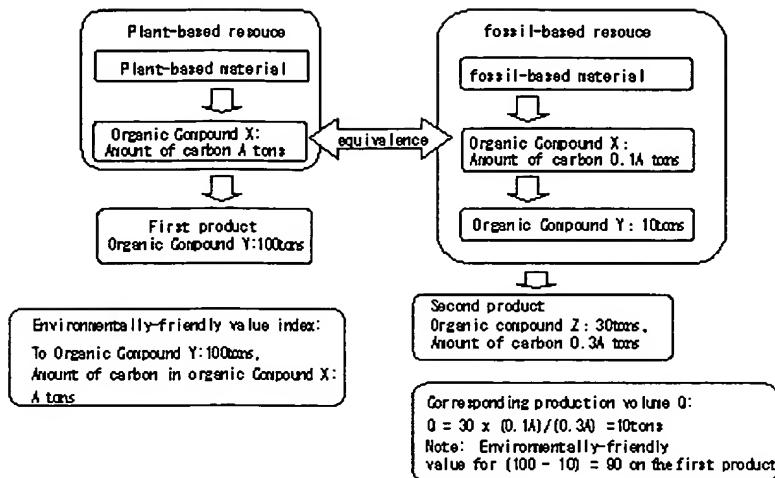


Fig. 22



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Fig.23

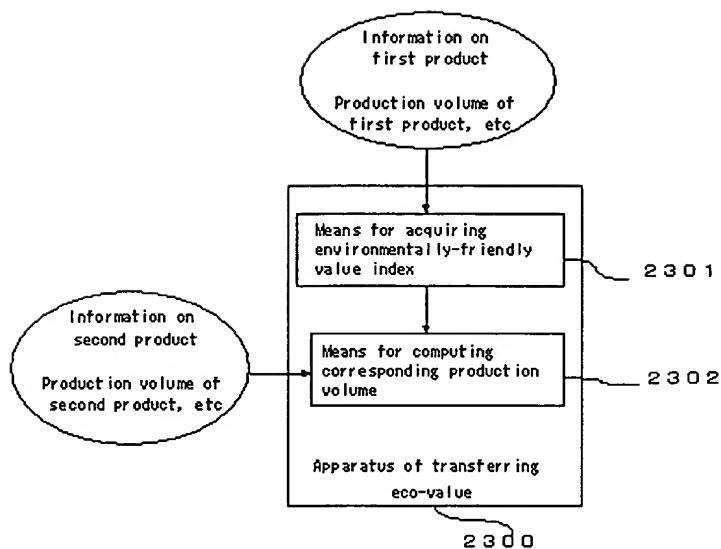


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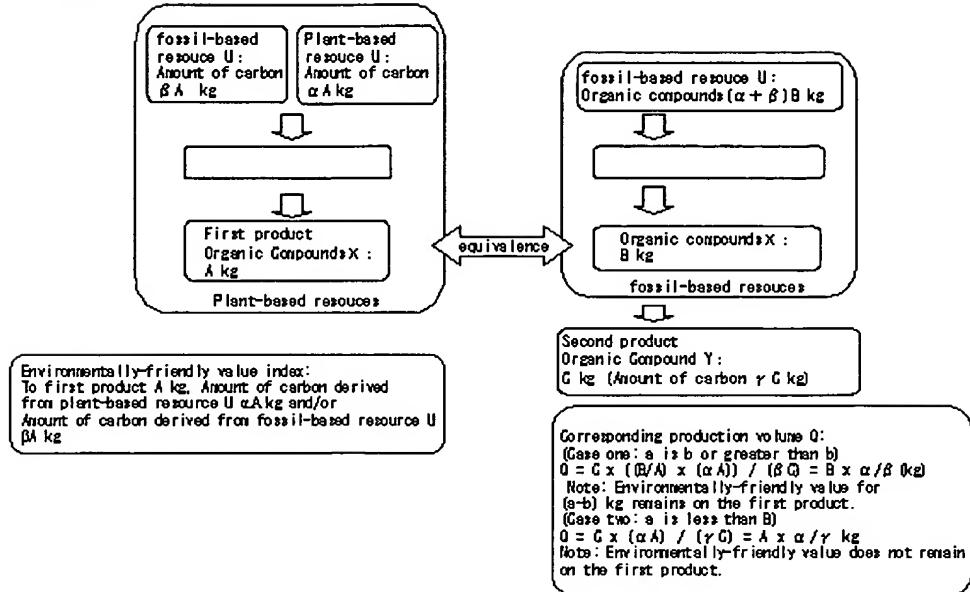


Fig. 25

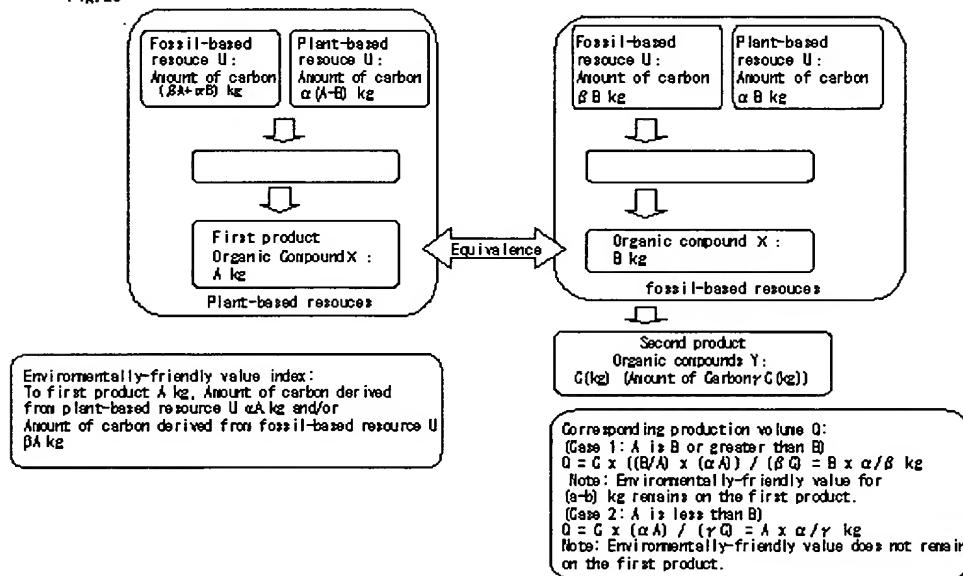


Fig. 26

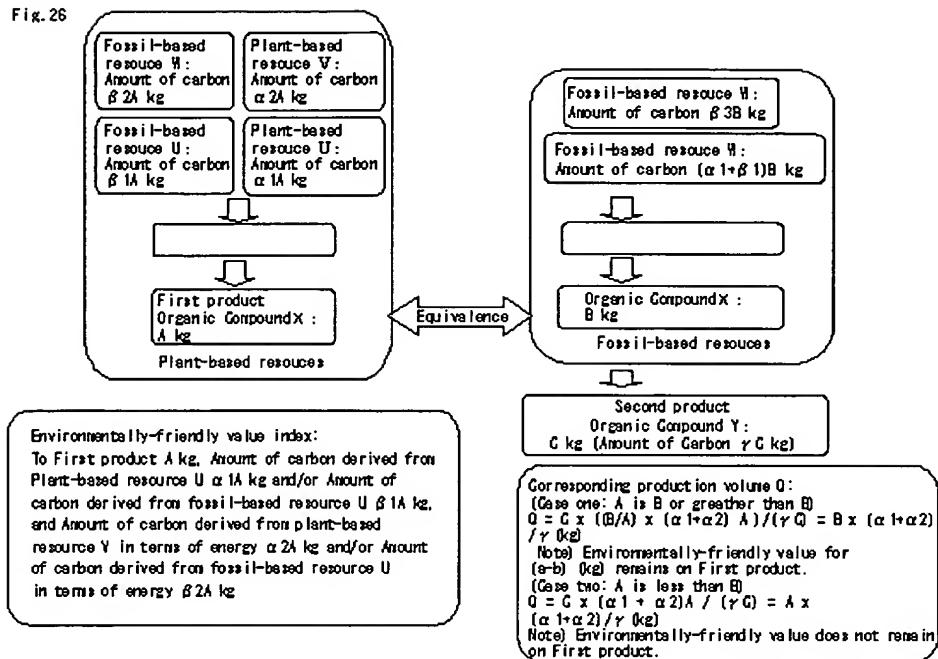


Fig. 27

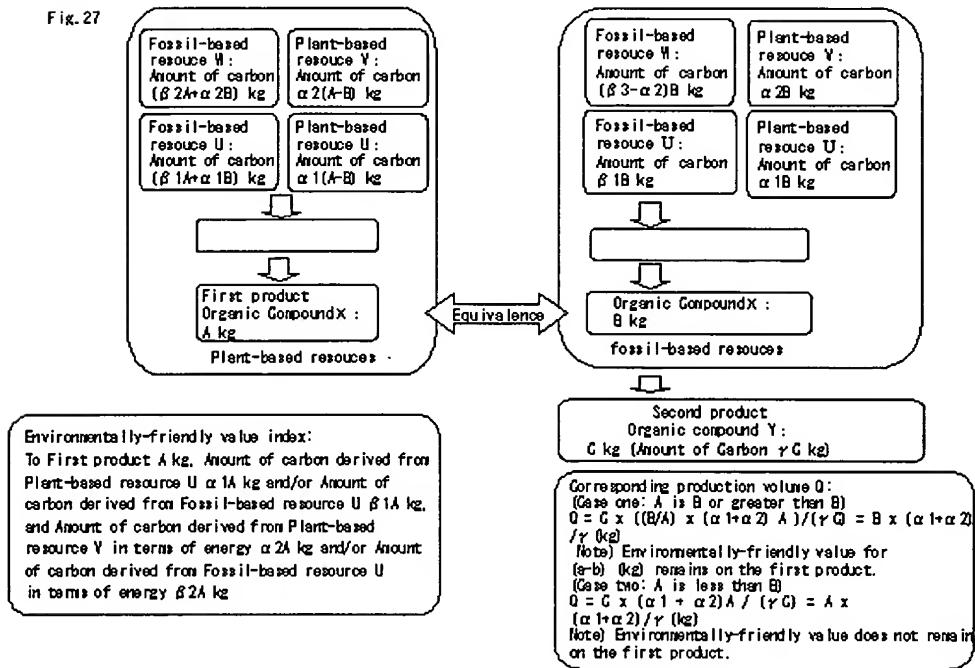


Fig. 28

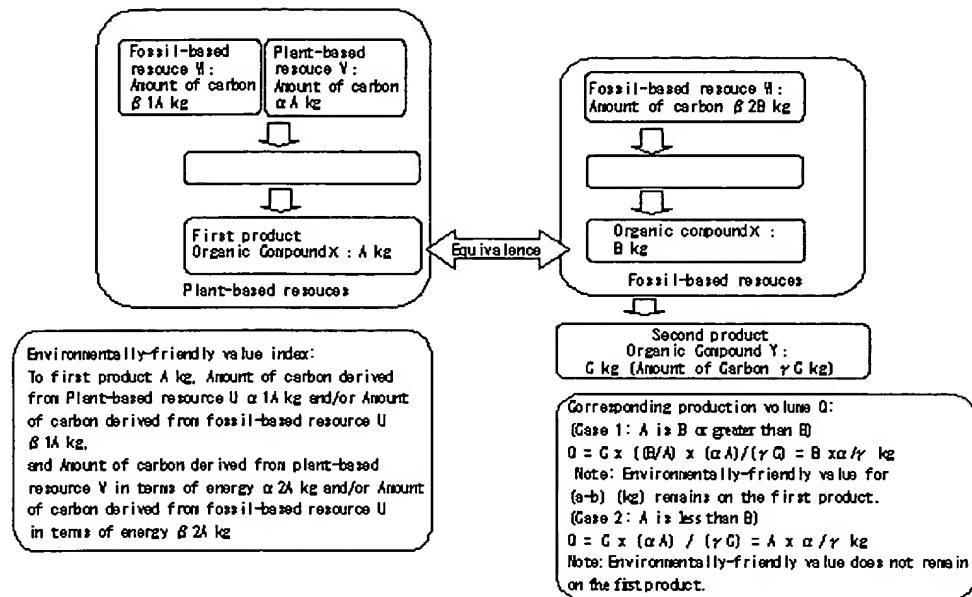


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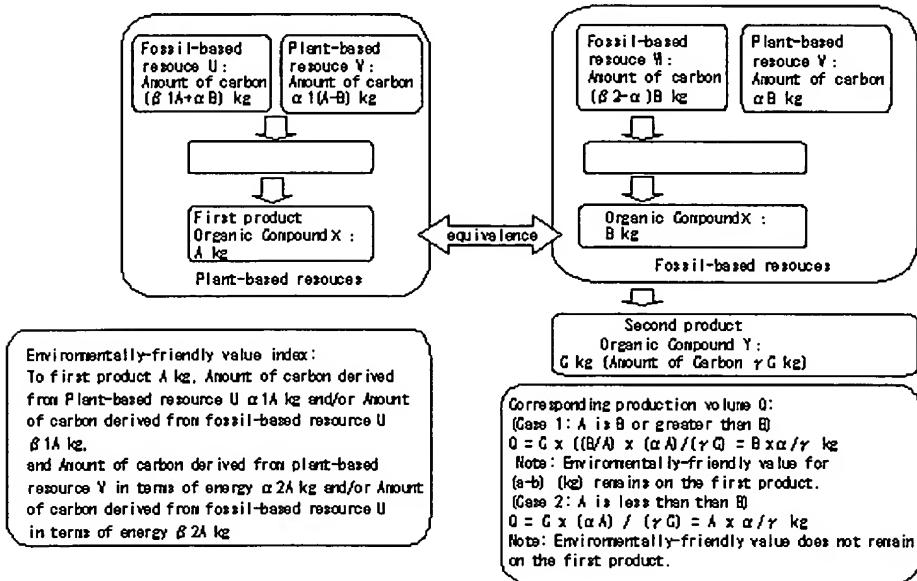


Fig. 30

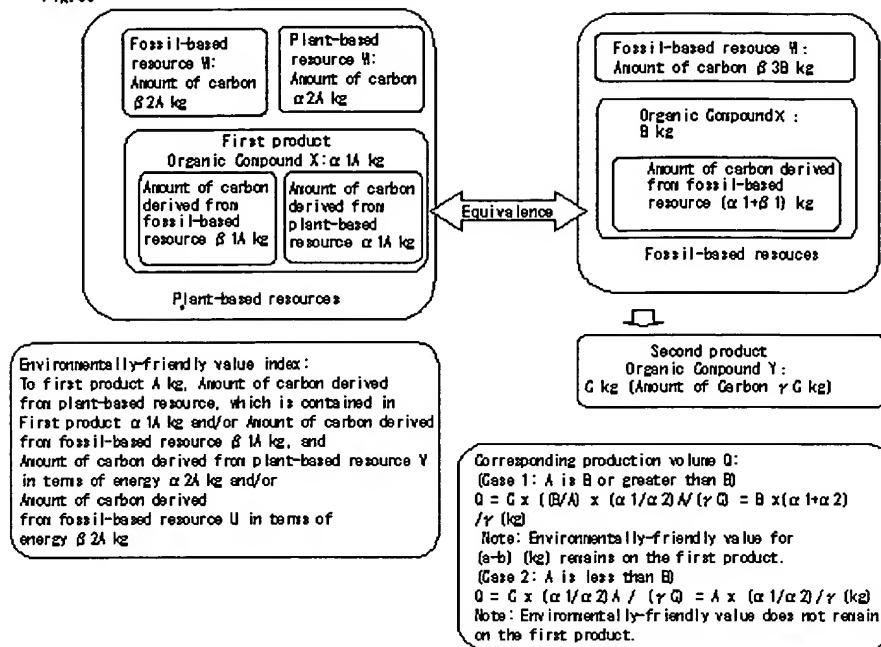


Fig. 31

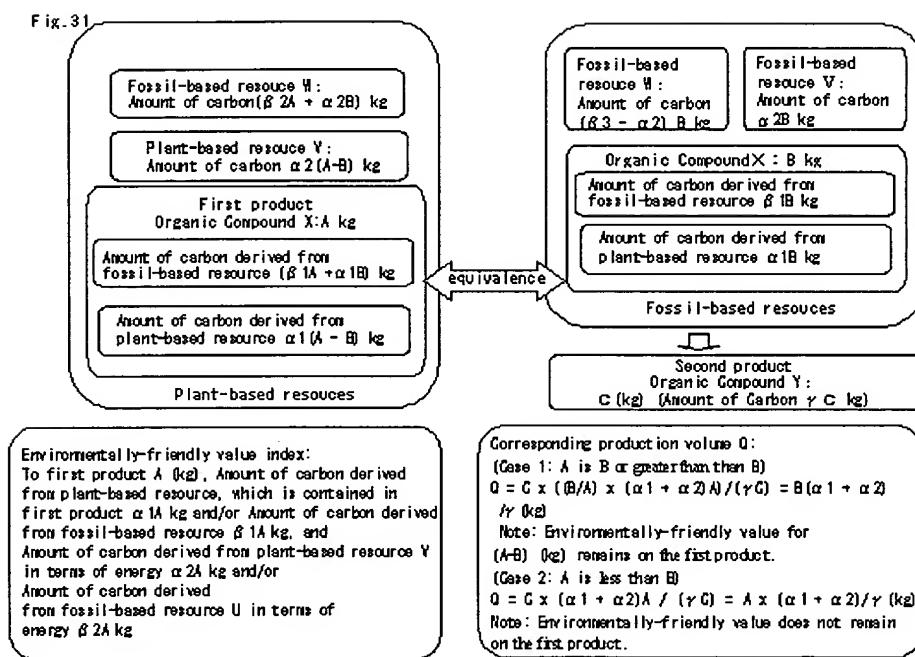


Fig.32

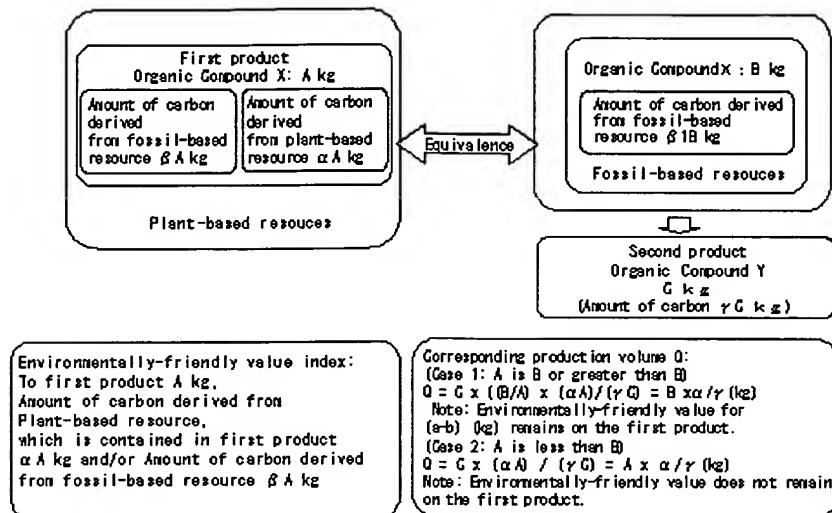


Fig.33

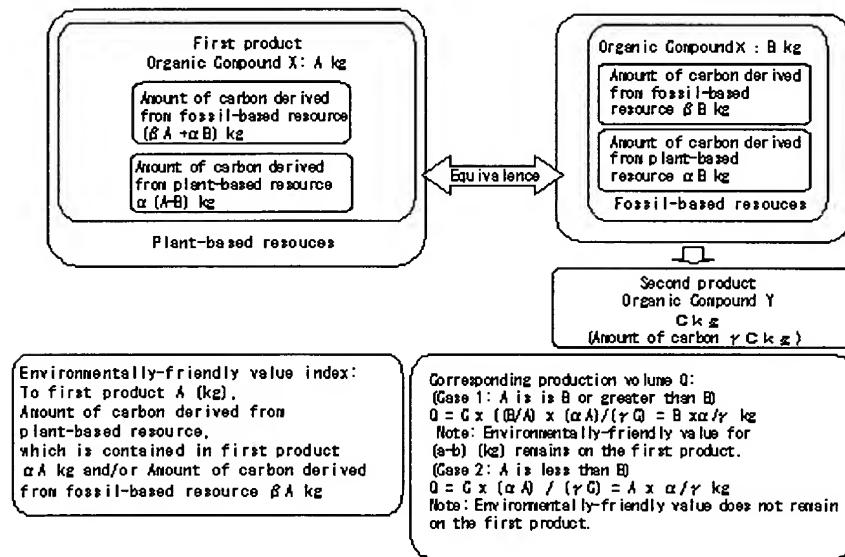


Fig. 34

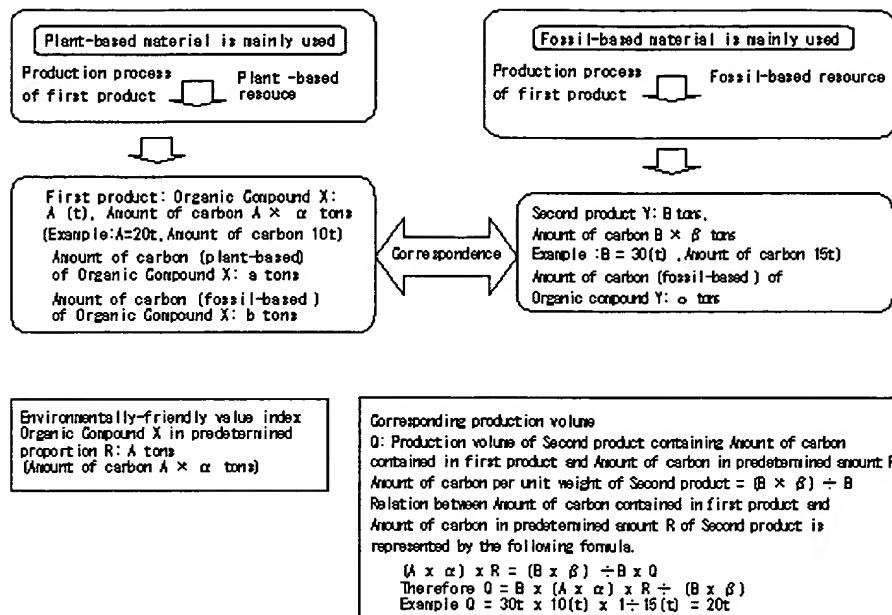


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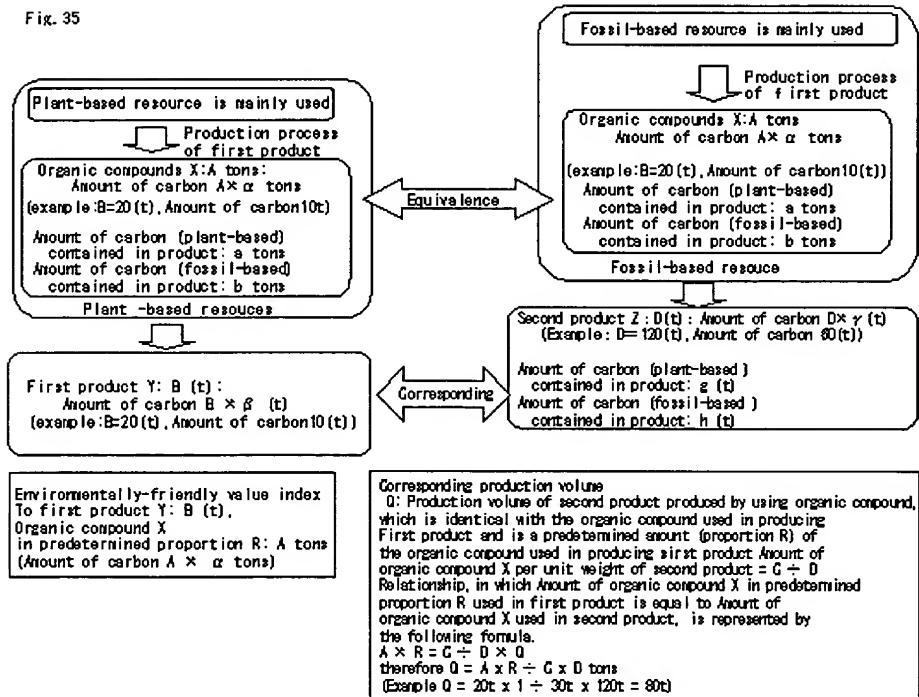
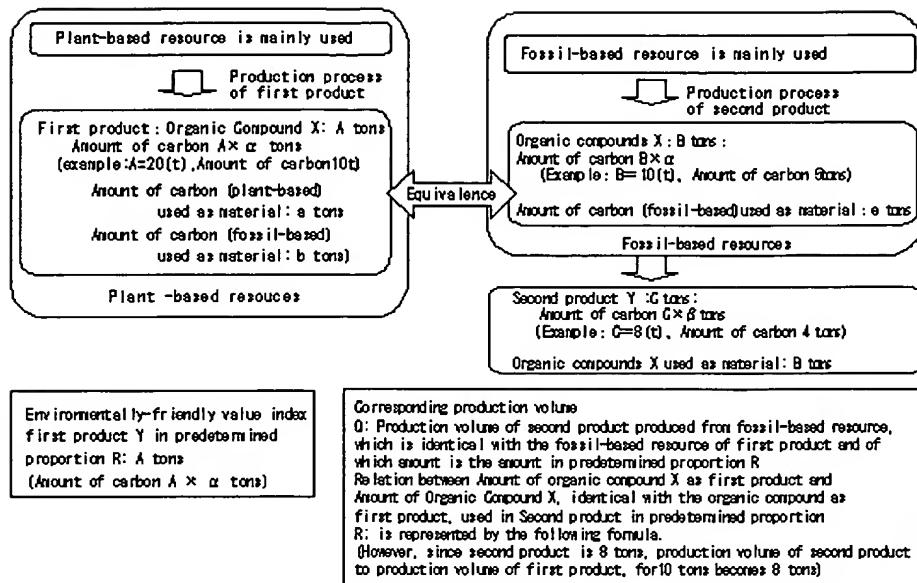
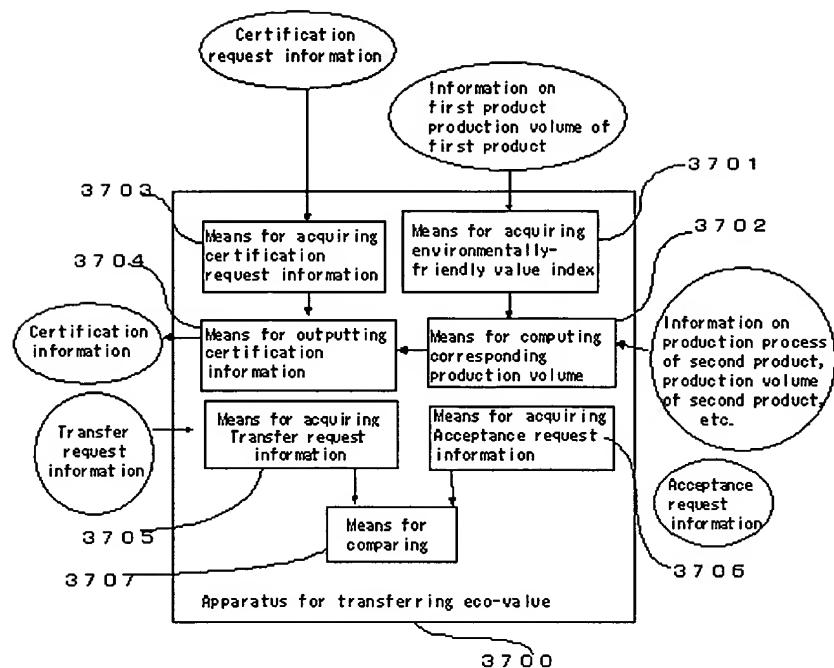


Fig. 36



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Fig.37



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Fig.38

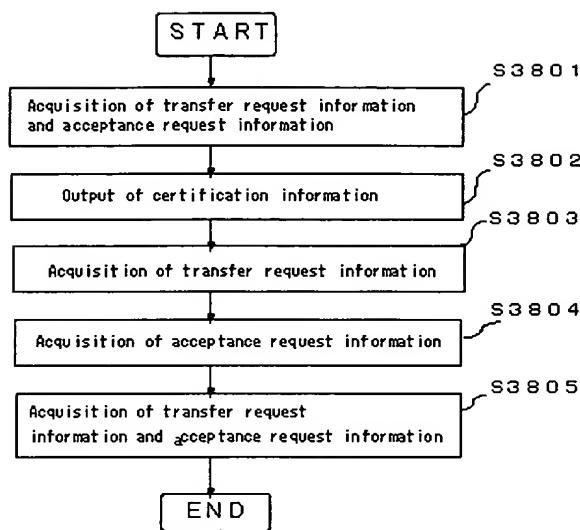


Fig. 39

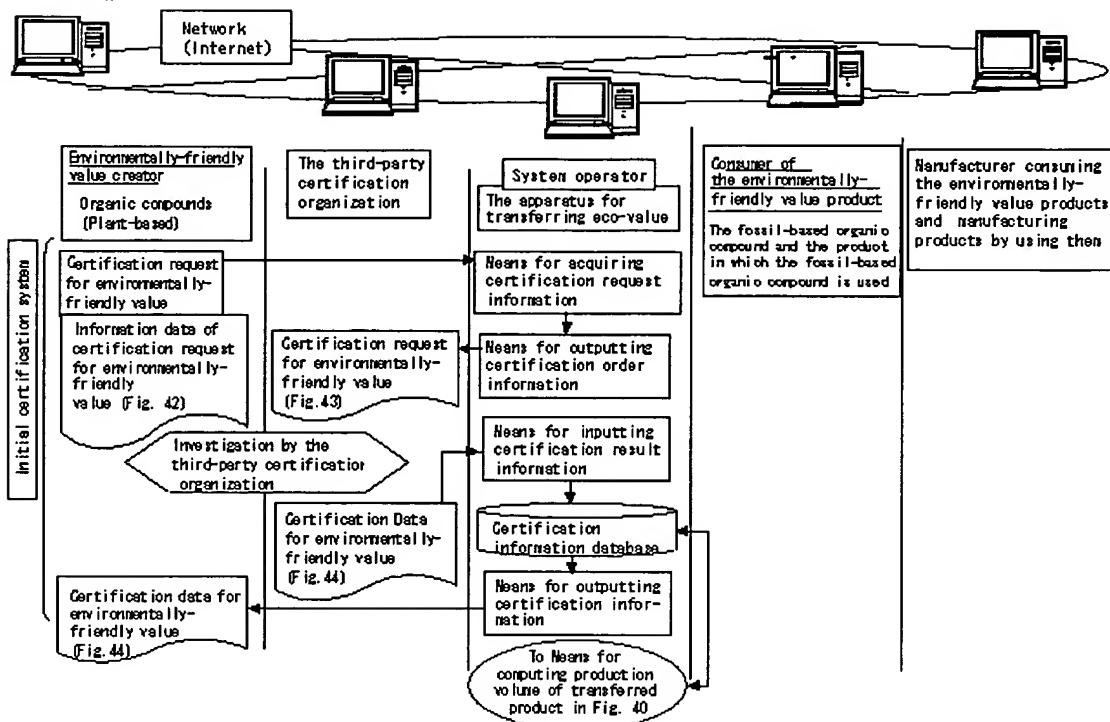


Fig. 40

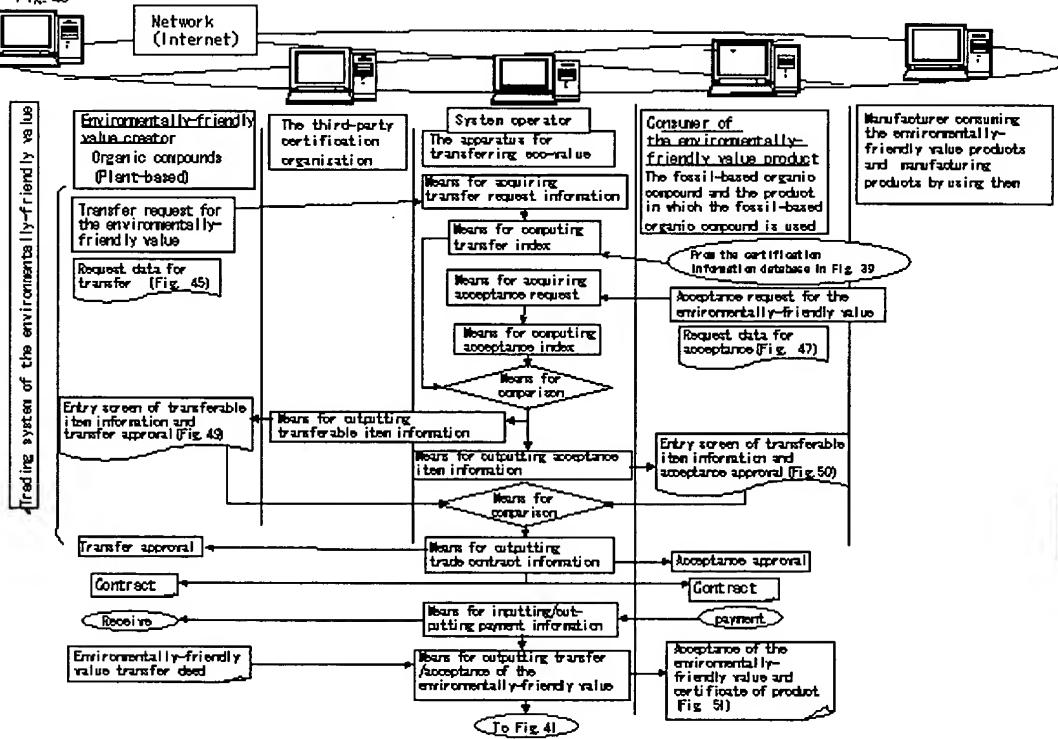


Fig. 41

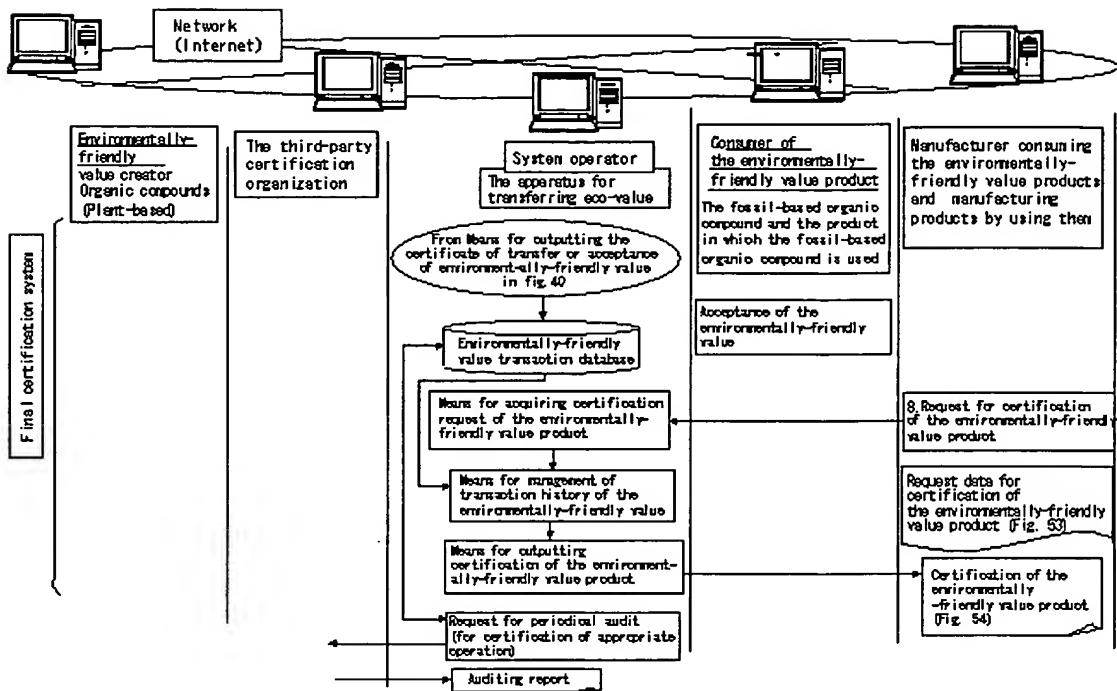


Fig.42

<p><u>Environmentally-friendly Value Certification Data</u></p> <p>(Entry screen)</p> <p>Client ID: XXXXXX</p> <p>Client name : XX Co.</p> <p>We request for acquisition of an environmentally-friendly value certification by a third party with respect to the following items:</p> <p>1) Substance for environmental value certification (e.g. ethylene (plant-based))</p> <p>2) Certification items of environmentally-friendly value</p> <p>-1 Origin of carbon contained in the object substance (Is carbon contained in ethylene plant- or fossil-based?)</p> <p>-2 Energy amount and energy source for production of the object substance (e.g. Electric power: X kWh/kg ethylene (thermal power 90% and hydroelectric power 10%) Heavy oil: X l/kg ethylene</p> <p>3) Quantity (e.g. ethylene 100 (kg))</p> <p>4) Production history of the object substance</p> <p>-1 Date of production</p> <p>-2 Lot No. of products</p> <p>-3 Name of factory and the address thereof</p> <p>-4 Name of plant material</p> <p>-5 Origin of plant material and the manufacturer thereof</p> <p>-6 Production process (e.g. sugar → ethanol → ethylene)</p> <p>-7 Amount and source of energy for production</p> <p>5) Usage for the object substance (e.g., used for production of PE, PS, PET)</p> <p>6) Secondary user of the object substance (e.g. X Plastic Industry Co., Y Plant)</p>
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Fig.43

Environmentally-friendly Value Certification Ordering Data

XX Certification Organization

We request for certification of Environmentally-friendly value of the following data.
Certification ID of the origin of environmentally-friendly value No. is granted to

Client ID:

Client name: X Co.

Address

POC (TEL, FAX, E-mail)

1) Object substance for environmental value certification (e.g. ethylene (plant-based))

1) Object substance for environmental value certification (e.g. ethylene (plant-based))

2) Certification items of environmentally-friendly value

-1 Origin of carbon contained in the object substance

(Is carbon contained in ethylene plant- or fossil-based?)

-2 Energy amount and energy source for production of the object substance

(e.g. Electric power: X kWh/kg ethylene (thermal power 90% and hydroelectric power 10%) Heavy oil:

X l/kg ethylene

3) Quantity (e.g. ethylene 100 (kg))

4) Production history of the object substance

-1 Date of production

-2 Lot No. of products

-3 Name of factory and the address thereof

-4 Name of plant material

-5 Origin of plant material and the manufacturer thereof

-6 Production process (e.g. sugar → ethanol → ethylene)

-7 Amount and source of energy for production

5) Plan for use of the object substance

(e.g. used for production of PE, PS, PET)

6) Secondary user of the object substance

(e.g. X Plastic Industry Co., Y Plant)

Fig.44

Environmentally-friendly Value Certification Data

Environmentally-friendly value of the product produced by the following manufacturer is certified as below.

Client ID:

Client name: X Co.

Certification ID of the origin of environmentally-friendly value No.

- 1) Object substance for environmental value certification (e.g. ethylene (plant-based))
- 2) Certification items of environmentally-friendly value

-1 Carbon contained in the molecular structure of the object substance X is plant-based as shown in the following production history.

Amount of object substance (e.g. ethylene): X kg

-2 Energy amount for production

To substance for environmental value certification 1 kg:

Electric power: X kWh/kg ethylene (thermal power 90% and hydroelectric power 10%)

Heavy oil: X l/kg ethylene

Natural gas: X Nm³/kg ethylene

3) Production history of the object substance

-1 Date of production

-2 Lot No. of products

-3 Name of factory and the address thereof

-4 Name of plant material

-5 Origin of plant material and the manufacturer thereof

-6 Production process (e.g. sugar → ethanol → ethylene)

-7 Amount and source of energy for production

4) Usage for the object substance

(e.g., used for production of PE, PS, PET)

5) Secondary user of the object substance

(e.g. X Plastic Industry Co., Y Plant)

Certifier: Certification Organization (month) (date) (year)

(Digital signature)

Fig.45

Transfer Request Data	Reference No. XXX
(Entry screen)	
Client ID: XXX	
Client name: XXX Co.	
(1) Certification ID of the source of environmentally-friendly value No. XXX	
(2) Name of the substance of transferor of an environmental value (e.g., ethylene)	
(3) Environmental value requested to be transferred	
-1 Source of carbon contained in the object substance (plant-based: XX %; fossil-based: YY %) (e.g. plant-based: 100 %; fossil-based: 0 %)	
-2 Energy amount and energy source for production of the object substance Amount of carbon in which fossil-based resource is used may be used as conversion. (e.g., Electric power: X kWh/kg ethylene (90% of thermal power, and 10% of hydroelectric power)	
Heavy oil: X l/kg ethylene	
(4) Quantity: XX kg in object substance, subscription to sale of forward contracts possible other than spots (e.g., ethylene 100 kg) (e.g., 1,000 kg by Y month of 20XX)	
(5) Suggested transfer price: Unit price: X yen/ kg ethylene environmental value	
* The entry screen changes according to the trading types, i.e., trades involving prices designated by buyers or sellers, auction, and reverse-auction.	
* The transfer price is may be indicated, inclusive of the source of carbon contained in the product and the energy for production, or itemized	

Fig.46

Method of computation of transfer index

(1)

The production volume of the first product is converted to the amount of plant-based carbon (X kg of the plant-based carbon) of the substance of transferor of an environmentally-friendly value (the first product).

(Example)

In case of ethylene, the amount of plant-based carbon is computed from the molecular weight by using the number of moles.

Ethylene: C₂H₄, the molecular weight: 28 and the number of moles: 24

Amount of ethylene: X kg × 24 ÷ 28 = Y kg carbon (I)

The percentage of the plant-based carbon from the transfer request data of Fig. 45 is multiplied.

(I) × percentage of plant-based carbon: X % = Y kg carbon (II)

(2)

Conversion to a unit price: Conversion to a suggested price for transfer per unit weight of plant-based carbon (X yen/ plant-based carbon kg)

(Example)

Conversion to unit price of the plant-based carbon of the suggested price for transfer

Unit price: X yen/ kg ethylene environmental value ÷ (II)

(3)

Conversion of energy for production: Conversion to the energy for production per unit carbon is made.

(Example)

The energy for production of unit weight of the substance of transferor of an environmentally-friendly value is divided by the total amount of carbon.

Fig.47

Acceptance Request Data (Entry screen)	Reference No. XXX
Client ID: XXX	
Client name: XXX Co.	
(1) Name of the object substance for acceptance of environmental value and history thereof	
Name of substance: XXX (e.g., polystyrene)	
History	
- Material name and basic unit e.g., 0.3 kg of Naphtha-based ethylene and 0.8 kg of Naphtha-based benzene,	
- Amount of styrene-monomer: 1.1 kg	
- Manufacturer of material, Manufacturing plant	
- Energy for production	
(2) Classification of swap or allotment of value: swap <input checked="" type="radio"/> , allotment <input type="radio"/>	
In case of allotment, the data is necessary, which indicates the purchase of the source of substance for environmentally-friendly value as in a system in which substances with an actual of environmentally-friendly value are traded.	
(3) Purpose for purchase of value	
-1 For a grant of an environmentally-friendly value to a product <input checked="" type="radio"/> -2 For speculation <input type="radio"/>	
(4) Environmental value requested for acceptance	
-1 Percentage of plant-based carbon: X% (e.g., 10%) (X% of plant-based carbon of total number of molecular of carbon is required)	
-2 Existence of request for swap or allotment of energy for production	
(5) Quantity: X kg (e.g., in 100 kg of polystyrene)	
Offer of subscription of sale of forward contracts other than spot may be permitted.	
(6) Suggested price for acceptance: X yen/kg of Y% Z of organic compound (e.g., X yen/kg of 10% of plant-based polystyrene)	
* The entry screen changes according to the trading types, i.e., trades involving prices designated by buyers or sellers, auction, and reverse-auction	

Fig.48

Method of computation of production volume for acceptance

(1)

The substance of transferee of an environmentally-friendly value (the second product) is converted to the amount of carbon requesting for an environmentally-friendly value (X kg of the plant-based carbon).

(Example)

To polystyrene: 100 kg, 10% of an environmentally-friendly value is required: Polystyrene is $(C_8H_5-CH=CH_2)_n$, total number of moles $(104)_n$, and the number of moles of carbon: $(12 \times 8)n = (96)n$; therefore, the unit weight of polystyrene X: $96 \div 104$
Moreover, the 10% of carbon requires the environmentally-friendly value, therefore:
 $1 \text{ kg} \times 96 \div 104 \times 10\% = 0.923 \text{ kg C}$ (III) Furthermore, in case of considering production loss, the conversion of basic unit is done.

(2)

Conversion to a unit price: Conversion to a unit price per unit of the acceptance of the environmentally-friendly value (X yen/ plant-based carbon kg)

(Example)

$X \text{ yen/ kg } 10\% \text{ plant-based polystyrene} \div (\text{III})$

(3)

Selection of the object substance of value swappable or value allottable and percentage of swap or allotment. (according to the conditions of trade)

(Example)

Assume that the object substance, to which an environmentally-friendly value is required to be allotted, is polystyrene. Since polystyrene is produced by deriving ethylene and benzene, if derivative is included in the conditions, ethylene, benzene, and polystyrene are selected as the object of acceptance of value, and they are used for data matching. In cases where polystyrene is produced from ethylene and benzene, and the percentage of carbon from ethylene is 25%; the substance of transferee of the environmentally-friendly value is matched with ethylene within the scope of 25% at maximum.

(4)

Conversion of energy for production: conversion to energy for production per unit carbon.

(Example)

The energy for production if unit weight of the substance of transferee of the environmentally-friendly value is divided by the total amount of carbon.

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Fig. 49

Entry screen (output screen) of transferable item information and transfer approval											
Client ID: XXXXX Client name: X Go		Substance for the environmentally-friendly value				Possible sale price					
verifi- cation no.	Certification of the source of the environmentally- friendly value	Substance name	Spot / Future	Amount	Possible transferee	Origin of carbon	Energy	Energy amount after conversion	Substance of trading partner	Sales approval	Swap/ Allotment
XXXXX	XXXXXX	ethylene	Spot	XXXkg	A chemical	XXX/kg	XXX/kg	—	ethylene	Transfer appro- val button	Allotment
XXXXX	XXXXXX	ethylene	Spot	XXXkg	B products	XXX/kg	XXX/kg	XXXg/kg ethylene	polystyrene	Transfer appro- val button	Swap
XXXXX	XXXXXX	ethylene	Spot	XXXkg	A chemical	XXX/kg	XXX/kg	—	polystyrene	Transfer appro- val button	Allotment
XXXXX		ethylene	Forward subscription	XXXkg	C motors	Variable price A/kg	XXX/kg	XXXg/kg ethylene	PET	Transfer appro- val button	Swap
XXXXX	XXXXXX	propylene	Spot	XXXkg	B products	XXX/kg	XXX/kg	XXXg/kg propylene	poly- propylene	Transfer appro- val button	Swap
XXXXX	XXXXXX	propylene	Forward subscription	XXXkg	A chemical	Variable price A/kg	XXX/kg	XXXg/kg propylene	propylene	Transfer appro- val button	Swap
XXXXX	XXXXXX	propylene	Spot	XXXkg	C motors	XXX/kg	XXX/kg	XXXg/kg propylene	poly- propylene	Transfer appro- val button	Swap



Fig. 50

Entry screen (output screen) of transferable item information and transfer approval											
Client ID: XXXXX Client name: X Go		Substance for the environmentally-friendly value				Possible sale price					
verifi- cation no.	Certification of the source of the environmentally- friendly value	Substance name	Spot / Forward	Amount	Possible transferee	Origin of carbon	Energy	Energy amount after conversion	Substance of trading partner	Sales approval	Swap/ Allotment
XXXXX	XXXXXX	ethylene	Spot	XXXkg	A chemical	XXX/kg	XXX/kg	XXXg/kg ethylene 10%	ethylene	Transfer appro- val button	Allotment
XXXXX	XXXXXX	polystyrene	Spot	XXXkg	B products	XXX/kg	XXX/kg	XXXg/kg polystyrene 20%	ethylene	Transfer appro- val button	Allotment
XXXXX		propylene	Forward Subscription	XXXkg	A chemical	XXX/kg	XXX/kg	XXXg/kg propylene 0%	propylene	Transfer appro- val button	Swap



Flow of the means for comparison

- 1) The transfer request data and the acceptance request data, which correspond to the value exchange trading or the value assignment trading, are matched based on the data of 4 the means for computing the corresponding production volume of transfer and 6 the means for computing the corresponding production volume of acceptance.
- 2) According to the data matched, conversion is executed on the data, which is outputted to 7 Entry screen (output screen) for the transferable item information and the transfer approval and 8 Entry screen (output screen) for the acceptable item information and the acceptance approval. After that, the data is transmitted to the means for outputting information.

Fig.51

Acceptance of Environmentally-friendly Value and Certification of product

Client ID:

Client name: A Co.

It is certified that A Co. accepts the environmentally-friendly value created by B Co. using the following processes and that the product possesses the following environmental value:

- 1) Certification ID of the provider of environmentally-friendly value No.
- 2) Transaction ID No. ~~XXX~~ is granted
- 3) Name of product: X resin
- 4) Production volume: X kg
 - 1 Percentage of carbon derived from plants in relation to the total amount of carbon contained in the product: X %
 - 2 Energy for production (converted to carbon: X kg C)
- The basis for the above computation will be described. If the certification number of the third party for energy for production of the fossil-based organic compound is provided, it will be described as well.
- 5) History of Environmentally-friendly value
 - 1 Name of substance for environmental value certification (e.g. ethylene (plant-based))
 - 2 Source of the environmentally-friendly value
 - 3 Carbon contained in the molecular structure of the object substance (ethylene) is plant-based as shown in the following production history.

Amount of the substance for environmental certification (e.g. ethylene): X kg and converted to carbon: X kg

To substance for environmental value certification 1 kg:
Electric power kwh/kg ethylene (thermal power 90% and hydroelectric power 10%)
Heavy oil 1/kg ethylene
Natural gas Nm3/kg ethylene
 - 4 Production history of the object substance
 - 1 Date of production
 - 2 Lot No. of products
 - 3 Name of factory and the address thereof
 - 4 Name of plant material
 - 5 Origin of plant material and the manufacturer thereof
 - 6 Production process (e.g. sugar → ethanol → ethylene)
 - 7 Amount and source of energy for production
 - 8 Secondary product of the substance providing environmental value (e.g., used for production of PE, PS, PET)
 - 9 Secondary user of the substance providing environmental value (e.g. X Plastic Industry Co., Y Plant)

Fig.52

Acceptance of Environmentally-friendly Value and Certification of transferability

Client ID:

Client name: A Co.

It is certified that A Co. accepts the environmentally-friendly value created by B Co. using the following processes and that the product possesses the following transferable environmental value

1) Certification ID of the provider of environmentally-friendly value No.

2) Transferable transaction ID No. is granted

3) Name of product: X resin

4) Production volume: X kg

-1 Percentage of carbon derived from plants in relation to the total amount of carbon contained in the product: X %

-2 Energy for production (converted to carbon: X kg C)

The basis for the above computation will be described. If the certification number of the third party for energy

for production of the fossil-based organic compound is provided, it will be described as well.

5) History of Environmentally-friendly value

-1 Name of substance for environmental value certification (e.g. ethylene (plant-based))

-2 Source of the environmentally-friendly value

-3 Carbon contained in the molecular structure of the object substance (ethylene) is plant-based as shown in
the following production history.

Amount of the substance for environmental certification (e.g. ethylene): X kg and converted to carbon: X kg

-3 Energy amount for production

To substance for environmental value certification 1 kg:

Electric power kwh/kg ethylene (thermal power 90% and hydroelectric power 10%)

Heavy oil l/kg ethylene

Natural gas Nm³/kg ethylene

-4 Production history of the object substance

-1 Date of production

-2 Lot No. of products

-3 Name of factory and the address thereof

-4 Name of plant material

-5 Origin of plant material and the manufacturer thereof

-6 Production process (e.g. sugar → ethanol → ethylene)

-7 Amount and source of energy for production

-8 Secondary product of the substance providing environmental value
(e.g., used for production of PE, PS, PET)

-9 Secondary user of the substance providing environmental value
(e.g. X Plastic Industry Co., Y Plant)

Fig.53

<p><u>Request Data for Certification of Product with Environmentally-friendly Value</u> (Entry screen)</p> <p>Client ID: Client name: X Co.</p> <p>We request for certification of the environmental value of the organic compound A used in B product produced by us.</p> <p>1) Certification ID of the source of environmentally-friendly value No. 2) Transaction ID (direct value trader) No. 3) Specification of the product for request of certification -1 Organic compound in product -2 Amount: X kg -3 Object for use: A parts of B product -4 Production Lot No. of A parts -5 Production Date</p>

Fig.54

<u>Certification of Environmentally-friendly Value Product</u>	
Client ID:	
Client name: X Co.	
It is certified that A parts produced by X Co. possesses the environmentally-friendly value created by B Co. using the following processes:	
1) Certification history	
-1 Certification ID of the source of environmentally-friendly value No.	
-2 Transaction ID (direct value trader) No.	
-3 <u>Certification ID of product No. is granted.</u>	
2) Object product: X cleaner, Y chassis: X kg	
3) Name of product: X resin	
4) Plant-based carbon percentage: X %	
5) Energy for production (converted to carbon: X kgC/ PS 10%)	
6) Source of the environmentally-friendly value	
-1 Carbon contained in the molecular structure of the object substance (ethylene) is plant-based as shown in the following production history.	
Amount of the substance for environmental certification (e.g. ethylene): X kg and converted to carbon: X kg	
-2 Energy amount for production	
To substance for environmental value certification 1 kg:	
Electric power kwh/kg ethylene (thermal power 90% and hydroelectric power 10%)	
Heavy oil 1/kg ethylene	
Natural gas Nm ³ /kg ethylene	
-2 Energy amount for production	
To substance for environmental value certification 1 kg:	
Electric power kwh/kg ethylene (thermal power 90% and hydroelectric power 10%)	
Heavy oil 1/kg ethylene	
Natural gas Nm ³ /kg ethylene	
7) Production history of the object substance	
-1 Date of production	
-2 Lot No. of products	
-3 Name of factory and the address thereof	
-4 Name of plant material	
-5 Origin of plant material and the manufacturer thereof	
-6 Production process (e.g. sugar → ethanol → ethylene)	
-8 Secondary product of the substance providing environmental value (e.g., used for production of PE, PS, PET)	
-9 Secondary user of the substance providing environmental value (e.g. X Plastic Industry Co., Y Plant)	
-7 Amount of energy for production	
-8 Secondary product of the substance providing environmental value (e.g., used for production of PE, PS, PET) .	
-9 Secondary user of the substance providing environmental value (e.g. X Plastic Industry Co., Y Plant)	
(e.g. X Plastic Industry Co., Y Plant)	

Fig.55

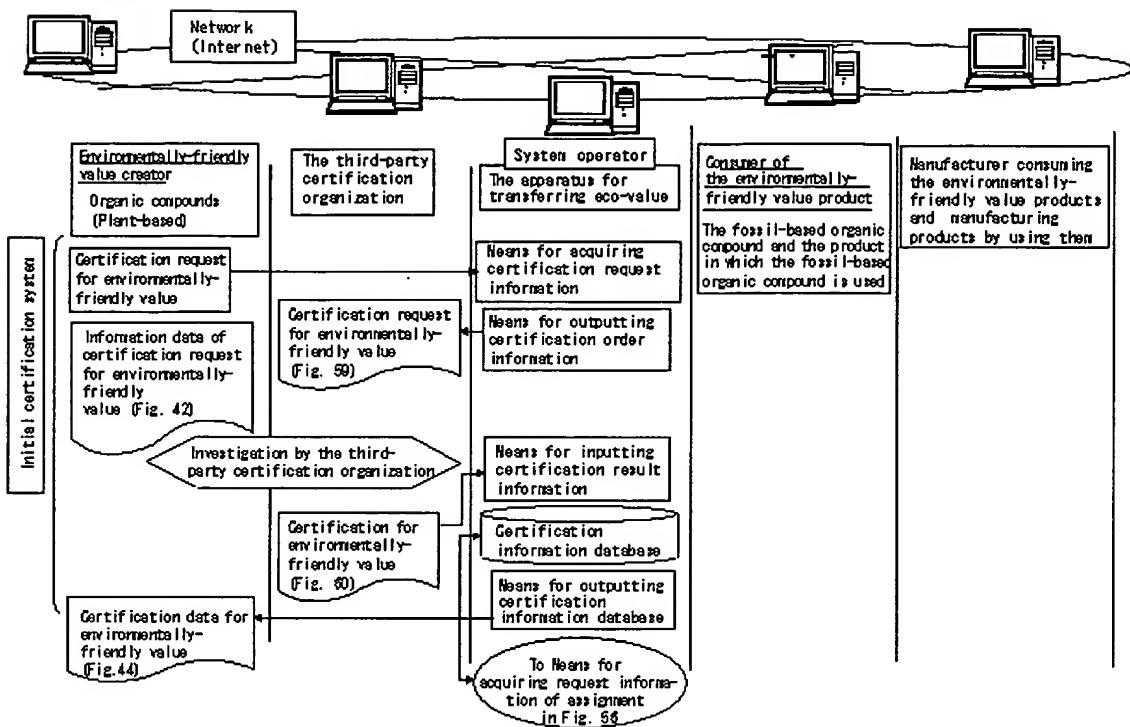


Fig.56

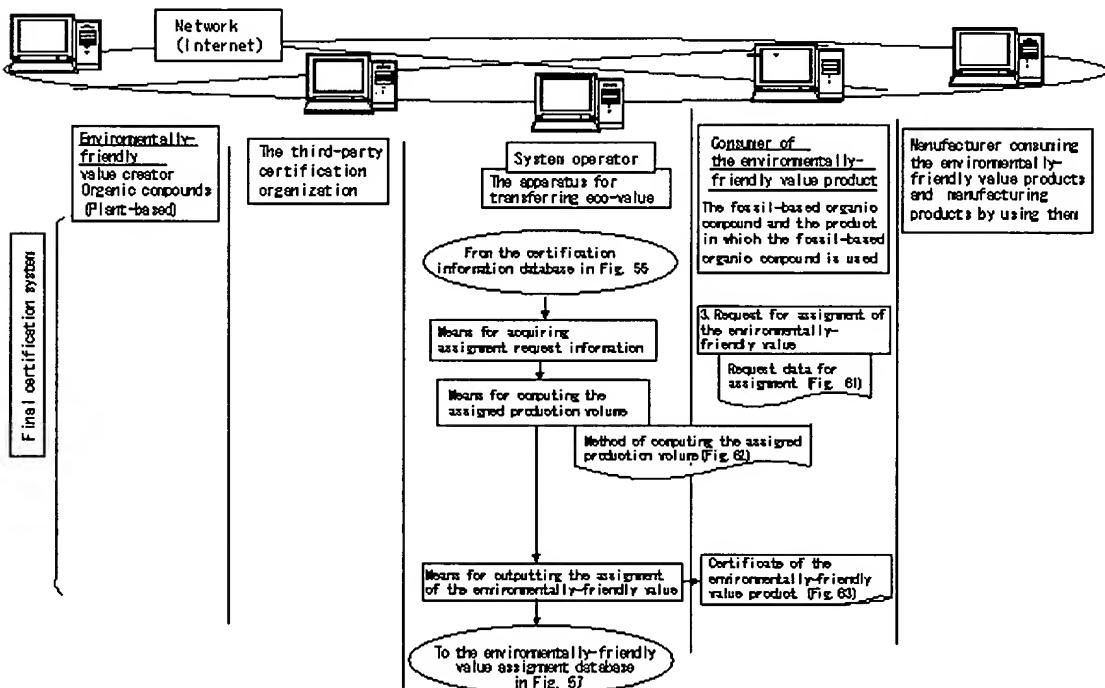


Fig.57

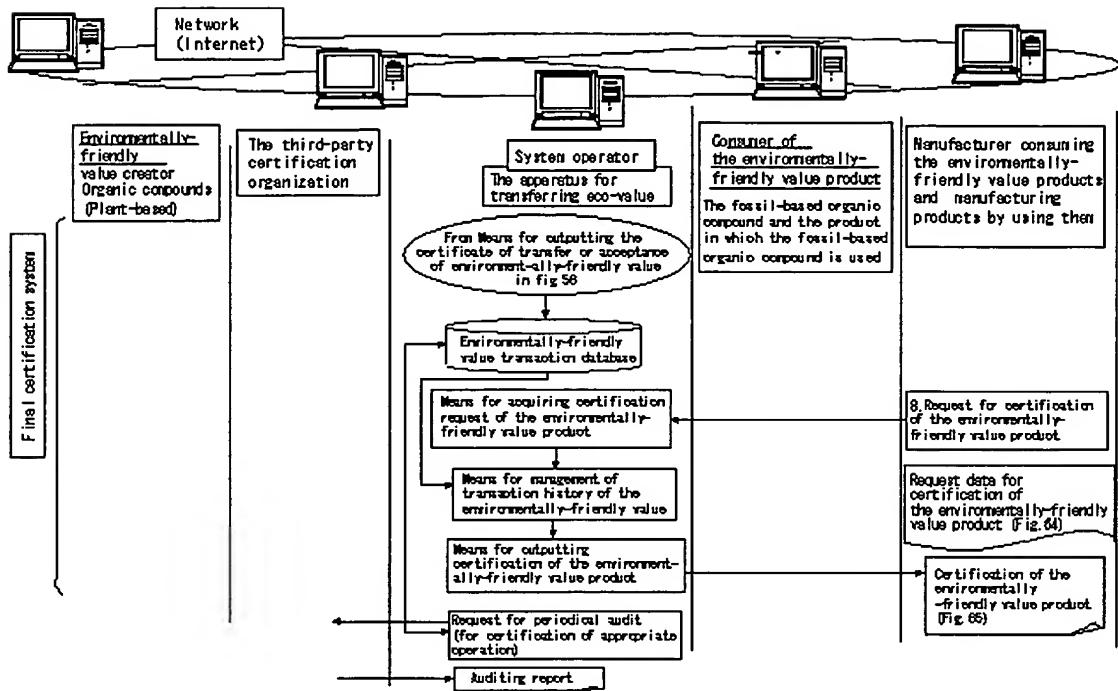


Fig.58

<p style="text-align: center;"><u>Environmentally-friendly Value Certification Request Information Data</u></p> <p>(Entry screen)</p> <p>Client ID: XXXXXX</p> <p>Client name : XX Co.</p> <p>We request for acquisition of an environmentally-friendly value certification by a third party with respect to the following items:</p> <p>1) Substance for environmental value certification (e.g. ethylene (plant-based))</p> <p>2) Certification items of environmentally-friendly value</p> <p>-1 Origin of carbon contained in the object substance (Is carbon contained in ethylene plant- or fossil-based?)</p> <p>-2 Energy amount and energy source for production of the object substance (e.g. Electric power: X kWh/kg ethylene (thermal power 90% and hydroelectric power 10%) Heavy oil: X l/kg ethylene)</p> <p>3) Quantity (e.g. ethylene 100 (kg))</p> <p>4) Production history of the object substance</p> <p>-1 Date of production</p> <p>-2 Lot No. of products</p> <p>-3 Name of factory and the address thereof</p> <p>-4 Name of plant material</p> <p>-5 Origin of plant material and the manufacturer thereof</p> <p>-6 Production process (e.g. sugar → ethanol → ethylene)</p> <p>-7 Amount and source of energy for production</p> <p>5) Usage for the object substance (e.g., used for production of PE, PS, PET)</p> <p>6) Secondary user of the object substance (e.g. X Plastic Industry Co., Y Plant)</p>

Fig.59

<p><u>Certification ID of the provider of environmentally-friendly value No. is granted to</u></p> <p>XX Certification Organization</p> <p>We request for certification of Environmentally-friendly value of the following data.</p> <p><u>Certification ID of the origin of environmentally-friendly value No. is granted to</u></p> <p>Client ID:</p> <p>Client name: X Co.</p> <p>Address</p> <p>POC (TEL, FAX, E-mail)</p> <p>1) Substance for environmental value certification (e.g. ethylene (plant-based))</p> <p>2) Certification items of environmentally-friendly value</p> <p>-1 Origin of carbon contained in the object substance (Is carbon contained in ethylene plant- or fossil-based?)</p> <p>-2 Energy amount and energy source for production of the object substance (e.g. Electric power: X kWh/kg ethylene (thermal power 90% and hydroelectric power 10%) Heavy oil: X l/kg ethylene</p> <p>3) Quantity (e.g. ethylene 100 (kg))</p> <p>4) Production history of the object substance</p> <p>-1 Date of production</p> <p>-2 Lot No. of products</p> <p>-3 Name of factory and the address thereof</p> <p>-4 Name of plant material</p> <p>-5 Origin of plant material and the manufacturer thereof</p> <p>-6 Production process (e.g. sugar → ethanol → ethylene)</p> <p>-7 Amount and source of energy for production</p> <p>5) Plan for use of the object substance (e.g. used for production of PE, PS, PET)</p> <p>6) Secondary user of the object substance (e.g. X Plastic Industry Co., Y Plant)</p>
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Fig.60

<p><u>Certification ID of the provider of environmentally-friendly value No. is granted to</u></p> <p>Environmentally-friendly value of the product produced by the following manufacturer is certified as below.</p> <p>Client ID: Client name: X Co.</p> <p><u>Certification ID of the origin of environmentally-friendly value No.</u></p> <p>1) Object substance for environmental value certification (e.g. ethylene (plant-based)) 2) Certification items of environmentally-friendly value</p> <p>-1 Carbon contained in the molecular structure of the object substance X is plant-based as shown in the following production history. <u>Amount of object substance (e.g. ethylene): X kg</u> -2 Energy amount for production To substance for environmental value certification 1 kg: Electric power: X kWh/kg ethylene (thermal power 90% and hydroelectric power 10%) Heavy oil: X l/kg ethylene Natural gas: X Nm³/kg ethylene</p> <p>3) Production history of the object substance -1 Date of production -2 Lot No. of products -3 Name of factory and the address thereof -4 Name of plant material -5 Origin of plant material and the manufacturer thereof -6 Production process (e.g. sugar → ethanol → ethylene) -7 Amount and source of energy for production</p> <p>4) Usage for the object substance (e.g., used for production of PE, PS, PET)</p> <p>5) Secondary user of the object substance (e.g. X Plastic Industry Co., Y Plant)</p> <p>Certifier: Certification Organization (month) (date) (year) (Digital signature)</p>
--

Fig.61

<p><u>Environmentally-friendly Value Allotment Request Data</u> (Entry screen) Client ID: XX Client name: XXX Co.</p> <p><u>(1) Certification ID of the source of environmentally-friendly value No. XXX</u></p> <p>(2) Name of the substance for certification of an environmental value (e.g., ethylene)</p> <p>(3) Environmental value requested to be allotted</p> <ul style="list-style-type: none">-1 Source of carbon contained in ethylene (plant-based or fossil-based and percentage thereof) (e.g. plant-based: 100 %; fossil-based: 0 %)-2 Energy amount and energy source for production of the object substance (e.g., Electric power: X kWh/kg ethylene (90% of thermal power, and 10% of hydroelectric power) Heavy oil: X l/kg ethylene)-3 Amount of energy for production of fossil-based ethylene If there is the certification ID of the third-party certification organization, it will be indicated: XXX <p>(4) Allotment request Polyethylene: 20% of plant-based: 5,000 kg</p> <p>(5) Basic unit necessary for substantial chemical conversion from the substance, which is the source of environmentally-friendly value, to organic compound, which is requested to be allotted.</p> <p>[Substantial amount of an environmentally-friendly value substance, which is necessary for producing derivative for allotment request per unit weight, and other necessary substances and amount thereof; in cases where the derivative of amount for allotment request is produced from the environmentally-friendly value substance]</p> <p>(e.g., only 1.1 kg of ethylene is necessary for producing 1 kg of polyethylene)</p>
--

Fig.62

Method of computation of corresponding production volume for allotment1. Computation of allotment of necessary volume of a substance with an environmentally-friendly value
(Example of computation of allotment)

The production volume of the organic compound of the originator of the environmentally-friendly value, which has been certificated, is computed based on the allotment request data of Fig. 61.
(Example)

Assume that the substance with an environmentally-friendly value is 2,000 kg of ethylene, and is allotted to 5,000 kg of polyethylene; plant-based 20%. In cases where the definition of percentage of plant-based is that percentage of the number of moles of plant-based carbon of total the number of moles of carbon contained in the object substance of computation of percentage of plant-based is greening percentage; the production volume of the organic compound of the originator of the environmentally-friendly value is converted to amount of carbon contained in the amount of substance providing an environmentally-friendly value, after that, conversion is done by the basic unit suggested in Fig. 61.

The number of moles of the carbon from ethylene of the number of moles $(28)n$ of polyethylene $(C_2H_4)_n$ is $(12 \times 2)n = (24)n$. In theory the number of moles of carbon of the total number of moles $(24)n \div$ the number of moles of carbon from ethylene $(24)n = 1$. Therefore, in cases where 20% of carbon per unit weight of polyethylene is set to plant-based carbon, it follows ratio $1 \times 20\%$. From the data of Fig. 61, in cases where 1.1 kg of ethylene to 1 kg of polyethylene; 1.1 kg \times 20% of ethylene is plant-based, substantially. Therefore, 20% plant-based carbon of 5,000 kg of ethylene is: $5,000 \text{ kg} \times 20\% \times 1.1 \text{ kg} = 1,100 \text{ kg}$. To 2,000 kg of ethylene with an environmentally-friendly value, 1,100 kg of the plant-based ethylene is allotted.

2. Computation of energy of organic compound, to which an environmentally-friendly value is allotted

The energy of organic compound, to which an environmentally-friendly value is allotted, is computed by amount of energy for production of organic compound with an environmentally-friendly value to the above necessary amount of ethylene + remaining amount of energy to a necessary amount of fossil-based organic compound.

Fig.63

Certification of Environmentally-friendly Value Product

(Entry screen)

Client ID:

Client name: X Co.

It is certified that the environmentally-friendly value created by B Co. using the following processes is assigned to the product of A Co.

1) Certification ID of the provider of environmentally-friendly value No.

2) Transaction ID No. 000 is granted

3) Name of product: X resin

4) Production volume: X kg

-1 Percentage of carbon derived from plants in relation to the total amount of carbon contained in the product: X %

-2 Energy for production (converted to carbon: X kg C)

The basis for the above computation will be described. If the certification number of the third party for energy

for production of the fossil-based organic compound is provided, it will be described as well.

5) History of Environmentally-friendly value

-1 Name of substance for environmental value certification (e.g. ethylene (plant-based))

-2 Source of the environmentally-friendly value

-3 Carbon contained in the molecular structure of the object substance (ethylene) is plant-based as shown in the following production history.

Amount of the substance for environmental certification (e.g. ethylene): X kg and converted to carbon: X kg

-3 Energy amount for production

To substance for environmental value certification 1 kg:

Electric power kwh/kg ethylene (thermal power 90% and hydroelectric power 10%)

Heavy oil l/kg ethylene

Natural gas Nm³/kg ethylene

-4 Production history of the object substance

-1 Date of production

-2 Lot No. of products

-3 Name of factory and the address thereof

-4 Name of plant material

-5 Origin of plant material and the manufacturer thereof

-6 Production process (e.g. sugar → ethanol → ethylene)

-7 Amount and source of energy for production

10/533686

Fig.64

Request Data for Certification of Product with Environmentally-friendly Value

(Entry screen)

Client ID:

Client name: X Co.

We request for certification of the environmental value of the organic compound A used in B product produced by us.

1) Certification ID of the source of environmentally-friendly value No.

2) Assignment ID No.

3) Specification of the product for request of certification

-1 Organic compound in product

-2 Amount: X kg

-3 Object for use: A parts of B product

-4 Production Lot No. of A parts

-5 Production Date

10/533686

Fig.65

Certification of Environmentally-friendly Value Product

Client ID:

Client name: X Co.

It is certified that A parts produced by X Co. possesses the environmentally-friendly value created by B Co. using the following processes:

1) Certification history

-1 Certification ID of the provider of environmentally-friendly value No.

-2 Transaction ID of the direct value trader No. is granted.

-3 Certification ID of the present product No. is granted.

2) Object product: X cleaner, Y chassis: X kg

3) Name of product: X resin

4) Plant-based carbon percentage: X %

5) Energy for production (converted to carbon: X kgC/ PS 10%)

6) Source of the environmentally-friendly value

-1 Carbon contained in the molecular structure of the object substance (ethylene) is plant-based as shown in the following production history.

Amount of the substance for environmental certification (e.g. ethylene): X kg and converted to carbon: X kg

-2 Energy amount for production

To substance for environmental value certification 1 kg:

Electric power kWh/kg ethylene (thermal power 90% and hydroelectric power 10%)

Heavy oil l/kg ethylene

Natural gas Nm³/kg ethylene

7) Production history of the object substance

-1 Date of production

-2 Lot No. of products

-3 Name of factory and the address thereof

-4 Name of plant material

-5 Origin of plant material and the manufacturer thereof

-6 Production process (e.g. sugar → ethanol → ethylene)

-8 Secondary product of the substance providing environmental value

(e.g., used for production of PE, PS, PET)

-9 Secondary user of the substance providing environmental value

(e.g. X Plastic Industry Co., Y Plant)

-7 Amount of energy for production

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